NOTICE

All drawings located at the end of the document.

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RRERA, D.W.	X	
RRI, M.S.		
LTON, J.C.		
ACOMINI, J.		
LL, L.		
RTINEZ, L.A.		
RKER, A.M.		
WERS, K.		
OTT, G.K.		
ELTON, D.C.	X	
EARS, M.S.		
ICE, K.D.		
ORHEIS, G.M.		
TLER, J.L.	X	X
OUSSARD, M	X	
R. CONTROL	X	X
MN. RECORD	X	X
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COMPANY

August 6, 2003

032-RF-01164

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CCDM

Mr. Richard DiSalvo
Environmental, Safety and Health
Compliance and Restoration
DOE, RFFO

Mr. Steve Gunderson
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Mr. Tim Rehder
U.S. Environmental Protection Agency
999 18th Street, Suite 300
Denver, CO 80202-2466

TRANSMITTAL OF THE FINAL DATA SUMMARY REPORT (page replacements) FOR IHSS GROUP 900 - 4&5 - JLB-074-03

Enclosed are page replacements to be made to the FINAL DATA SUMMARY REPORT FOR IHSS GROUP 900 - 4&5. Please exchange former pages containing Tables 2 and 3 as well as Figure 2 (pages 5 through 24) with the new set as they have been modified to reflect a change in the radionuclide data. A new Table of Contents page has also been supplied. The document and NFAA recommendation was approved by CDPHE on July 23, 2003.

If you have any questions, please contact me at extension 5245.

Karen A Wiemelt FOR

J. Lane Butler
Manager, Environmental Restoration Programs

JLB:kg

Original and 1 cc – Richard DiSalvo
cc: Norma Castañeda

Enclosures:
As stated

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX

ENCLOSURE

Real and QC Data (compact disc)

Table 2
PAC 900-175 – Results Greater than Background Mean Plus Two Standard Deviations or Reporting/Detection Limits

Location Code	Analyte	Result	DL/RL Limit	Background Mean +2 SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
CK43-001	Antimony	3.90	0.42	-	409	-	mg/kg
CK43-002	Antimony	2.80	0.43	-	409	-	mg/kg
CL43-002	Antimony	0.92	0.44	-	409	-	mg/kg
CK43-000	Benzo(a)anthracene	100.00	40.00	-	34900	800000	ug/kg
CK43-001	Benzo(a)anthracene	180.00	41.00	-	34900	800000	ug/kg
CK43-002	Benzo(a)anthracene	210.00	40.00	-	34900	800000	ug/kg
CL43-000	Benzo(a)anthracene	44.00	40.00	-	34900	800000	ug/kg
CL43-001	Benzo(a)anthracene	310.00	39.00	-	34900	800000	ug/kg
CL43-002	Benzo(a)anthracene	160.00	41.00	-	34900	800000	ug/kg
CK43-000	Benzo(a)pyrene	140.00	97.00	-	3490	25700	ug/kg
CK43-001	Benzo(a)pyrene	230.00	99.00	-	3490	25700	ug/kg
CK43-002	Benzo(a)pyrene	240.00	96.00	-	3490	25700	ug/kg
CL43-001	Benzo(a)pyrene	270.00	95.00	-	3490	25700	ug/kg
CL43-002	Benzo(a)pyrene	190.00	98.00	-	3490	25700	ug/kg
CK43-000	Benzo(b)fluoranthene	130.00	100.00	-	34900	1010000	ug/kg
CK43-001	Benzo(b)fluoranthene	240.00	110.00	-	34900	1010000	ug/kg
CK43-002	Benzo(b)fluoranthene	230.00	100.00	-	34900	1010000	ug/kg
CL43-001	Benzo(b)fluoranthene	240.00	100.00	-	34900	1010000	ug/kg
CL43-002	Benzo(b)fluoranthene	170.00	100.00	-	34900	1010000	ug/kg
CK43-000	Benzo(k)fluoranthene	150.00	96.00	-	349000	1010000	ug/kg
CK43-001	Benzo(k)fluoranthene	230.00	98.00	-	349000	1010000	ug/kg
CK43-002	Benzo(k)fluoranthene	240.00	95.00	-	349000	1010000	ug/kg
CL43-001	Benzo(k)fluoranthene	290.00	94.00	-	349000	1010000	ug/kg
CL43-002	Benzo(k)fluoranthene	200.00	97.00	-	349000	1010000	ug/kg
CK43-000	bis(2-Ethylhexyl)phthalate	82.00	71.00	-	1970000	-	ug/kg
CK43-001	bis(2-Ethylhexyl)phthalate	75.00	73.00	-	1970000	-	ug/kg

Table 2
PAC 900-175 – Results Greater than Background Mean Plus Two Standard Deviations or Reporting/Detection Limits

Location Code	Analyte	Result	DL/RL Limit	Background Mean +2 SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
CK43-002	bis(2-Ethylhexyl)phthalate	310.00	70.00	-	1970000	-	ug/kg
CL43-000	bis(2-Ethylhexyl)phthalate	7400.00	70.00	-	1970000	-	ug/kg
CL43-001	bis(2-Ethylhexyl)phthalate	100.00	70.00	-	1970000	-	ug/kg
CL43-002	bis(2-Ethylhexyl)phthalate	170.00	72.00	-	1970000	-	ug/kg
CK43-000	Chrysene	150.00	55.00	-	3490000	-	ug/kg
CK43-001	Chrysene	260.00	56.00	-	3490000	-	ug/kg
CK43-002	Chrysene	260.00	54.00	-	3490000	-	ug/kg
CL43-000	Chrysene	58.00	54.00	-	3490000	-	ug/kg
CL43-002	Chrysene	210.00	55.00	-	3490000	-	ug/kg
CK43-002	Dibenz(a,h)anthracene	64.00	48.00	-	3490	-	ug/kg
CK43-001	Dimethylphthalate	110.00	89.00	-	1000000000	-	ug/kg
CK43-002	Dimethylphthalate	320.00	86.00	-	1000000000	-	ug/kg
CK43-002	Di-n-butylphthalate	130.00	77.00	-	73700000	-	ug/kg
CK43-000	Fluoranthene	330.00	87.00	-	27200000	-	ug/kg
CL43-000	Fluoranthene	120.00	86.00	-	27200000	-	ug/kg
CK43-000	Indeno(1,2,3-cd)pyrene	73.00	49.00	-	34900	-	ug/kg
CK43-001	Indeno(1,2,3-cd)pyrene	150.00	50.00	-	34900	-	ug/kg
CK43-002	Indeno(1,2,3-cd)pyrene	160.00	49.00	-	34900	-	ug/kg
CL43-001	Indeno(1,2,3-cd)pyrene	150.00	49.00	-	34900	-	ug/kg
CL43-002	Indeno(1,2,3-cd)pyrene	110.00	50.00	-	34900	-	ug/kg
CL43-001	Lithium	11.60	0.24	11.55	20400	-	mg/kg
CK43-000	Molybdenum	2.20	0.13	-	5110	-	mg/kg
CK43-001	Molybdenum	1.10	0.13	-	5110	-	mg/kg
CK43-002	Molybdenum	2.40	0.13	-	5110	-	mg/kg
CL43-000	Molybdenum	0.93	0.13	-	5110	-	mg/kg
CL43-001	Molybdenum	2.40	0.13	-	5110	-	mg/kg

Table 2
PAC 900-175 – Results Greater than Background Mean Plus Two Standard Deviations or Reporting/Detection Limits

Location Code	Analyte	Result	DL/RL Limit	Background Mean +2 SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
CL43-002	Molybdenum	0.74	0.13	-	5110	-	mg/kg
CK43-000	Nitrate	1.80	0.21	-	1000000	-	mg/kg
CK43-002	Nitrate	2.50	0.20	-	1000000	-	mg/kg
CL43-000	Nitrate	1.80	0.20	-	1000000	-	mg/kg
CL43-001	Nitrate	1.90	0.20	-	1000000	-	mg/kg
CL43-002	Nitrate	2.60	0.21	-	1000000	-	mg/kg
CK43-000	Nitrite	1.30	0.25	-	102000	-	mg/kg
CK43-001	Nitrite	1.40	0.25	-	102000	-	mg/kg
CL43-000	Nitrite	1.20	0.24	-	102000	-	mg/kg
CL43-001	Nitrite	1.20	0.24	-	102000	-	mg/kg
CL43-002	Nitrite	1.80	0.25	-	102000	-	mg/kg
CK43-000	Pyrene	290.00	41.00	-	22100000	-	ug/kg
CL43-000	Pyrene	100.00	82.00	-	22100000	-	ug/kg
CL43-000	Pyrene	100.00	41.00	-	22100000	-	ug/kg
CK43-000	Tin	2.00	0.29	-	613000	-	mg/kg
CK43-001	Tin	1.60	0.28	-	613000	-	mg/kg
CK43-002	Tin	1.60	0.29	-	613000	-	mg/kg
CL43-000	Tin	1.00	0.28	-	613000	-	mg/kg
CL43-001	Tin	2.30	0.28	-	613000	-	mg/kg
CL43-002	Tin	1.70	0.29	-	613000	-	mg/kg
CL43-000	Uranium-238	2.90	1.42	2.00	351	1600	pCi/g

DL/RL = Detection or Reporting Limit
— = Not Available
SD = Standard Deviation

Table 3
PAC 900-175 Summary of Analytical Results

Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	DL/RL	Backgound Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
1,2,4-Trichlorobenzene	7	0.00%	387.14	670	130	-	9230000	-	ug/kg
1,2-Dichlorobenzene	7	0.00%	387.14	670	130	-	31200000	-	ug/kg
1,4-Dichlorobenzene	7	0.00%	387.14	670	110	-	840000	-	ug/kg
2,4,5-Trichlorophenol	7	0.00%	387.14	670	150	-	102000000	-	ug/kg
2,4,6-Trichlorophenol	7	0.00%	387.14	670	100	-	3470000	-	ug/kg
2,4-Dichlorophenol	7	0.00%	387.14	670	180	-	3070000	-	ug/kg
2,4-Dimethylphenol	7	0.00%	387.14	670	190	-	20400000	-	ug/kg
2,4-Dinitrophenol	7	0.00%	1871.43	3300	1000	-	2040000	-	ug/kg
2,4-Dinitrotoluene	7	0.00%	387.14	670	200	-	56300	-	ug/kg
2,6-Dinitrotoluene	7	0.00%	387.14	670	200	-	56300	-	ug/kg
2-Chloronaphthalene	7	0.00%	387.14	670	77	-	81800000	-	ug/kg
2-Chlorophenol	7	0.00%	387.14	670	150	-	5110000	-	ug/kg
2-Methylnaphthalene	7	0.00%	387.14	670	120	-	20400000	-	ug/kg
2-Methylphenol	7	0.00%	387.14	670	160	-	36900000	-	ug/kg
2-Nitroaniline	7	0.00%	1871.43	3300	160	-	16700000	-	ug/kg
3,3'-Dichlorobenzidine	7	0.00%	1514.29	2600	140	-	61300	-	ug/kg
4,6-Dinitro-2-methylphenol	7	0.00%	1871.43	3300	860	-	1020000	-	ug/kg
4-Chloroaniline	7	0.00%	387.14	670	96	-	2950000	-	ug/kg
4-Methylphenol	7	0.00%	387.14	670	150	-	3690000	-	ug/kg
4-Nitrophenol	7	0.00%	1871.43	3300	190	-	8180000	-	ug/kg
Acenaphthene	7	0.00%	387.14	670	94	-	40800000	-	ug/kg
Aluminum	6	0.00%	11291.67	14600	1.9	16902	228000	-	mg/kg
Americium-241	6	0.00%	1.06	1.23	1.23	0.02	76	1900	pCi/g
Anthracene	7	0.00%	387.14	670	160	-	204000000	-	ug/kg

Table 3
PAC 900-175 Summary of Analytical Results

Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	DL/RL	Backgound Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Antimony	6	50.00%	1.48	3.9	0.44	-	409	-	mg/kg
Arsenic	6	0.00%	3.70	4.6	0.4	10.09	22.2	21.6	mg/kg
Barium	6	0.00%	82.88	95.7	0.055	141.26	26400	-	mg/kg
Benzo(a)anthracene	7	85.71%	239.14	670	79	-	34900	800000	ug/kg
Benzo(a)pyrene	7	71.43%	297.14	670	190	-	3490	25700	ug/kg
Benzo(b)fluoranthene	7	71.43%	288.57	670	200	-	34900	1010000	ug/kg
Benzo(k)fluoranthene	7	71.43%	302.86	670	190	-	349000	1010000	ug/kg
Benzoic Acid	7	0.00%	1871.43	3300	1200	-	1000000000	-	ug/kg
Benzyl Alcohol	7	0.00%	387.14	670	160	-	307000000	-	ug/kg
Beryllium	6	0.00%	0.38	0.46	0.052	0.97	921	2.15	mg/kg
bis(2-Chloroethyl)ether	7	0.00%	387.14	670	100	-	34800	-	ug/kg
bis(2-Chloroisopropyl)ether	7	0.00%	387.14	670	140	-	547000	-	ug/kg
bis(2-Ethylhexyl)phthalate	7	100.00%	2548.14	9700	140	-	1970000	-	ug/kg
Butylbenzylphthalate	7	0.00%	387.14	670	69	-	147000000	-	ug/kg
Cadmium	6	0.00%	0.27	0.85	0.036	1.61	962	-	mg/kg
Calcium	6	50.00%	18968.33	47300	1	4467	-	-	mg/kg
Chromium VI	6	100.00%	70.82	114	0.36	-	268	-	mg/kg
Chrysene	7	85.71%	285.43	670	110	-	3490000	-	ug/kg
Cobalt	6	0.00%	4.60	5.8	0.35	10.91	1550	-	mg/kg
Copper	6	100.00%	37.00	74.4	0.19	18.06	40900	-	mg/kg
Cs-137	6	0.00%	0.08	0.0987	0.0958	1.68	-	-	pCi/g
Di-n-butylphthalate	7	14.29%	357.14	670	150	-	73700000	-	ug/kg
Di-n-octylphthalate	7	0.00%	387.14	670	73	-	14700000	-	ug/kg
Dibenz(a,h)anthracene	7	14.29%	347.71	670	96	-	3490	-	ug/kg
Dibenzofuran	7	0.00%	387.14	670	170	-	2950000	-	ug/kg

Table 3
PAC 900-175 Summary of Analytical Results

Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	DL/RL	Backgound Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Diethylphthalate	7	0.00%	767.14	1300	110	-	590000000	-	ug/kg
Dimethylphthalate	7	28.57%	350.00	670	170	-	1000000000	-	ug/kg
Fluoranthene	7	85.71%	477.14	690	170	-	27200000	-	ug/kg
Fluorene	7	0.00%	387.14	670	150	-	40800000	-	ug/kg
Hexachlorobenzene	7	0.00%	387.14	670	150	-	17200	-	ug/kg
Hexachlorobutadiene	7	0.00%	387.14	670	200	-	147000	-	ug/kg
Hexachlorocyclopentadiene	7	0.00%	767.14	1300	67	-	3500000	-	ug/kg
Hexachloroethane	7	0.00%	387.14	670	100	-	737000	1990000	ug/kg
Indeno(1,2,3-cd)pyrene	7	71.43%	236.14	670	98	-	34900	-	ug/kg
Iron	6	16.67%	15600.00	18900	1.7	18037	307000	-	mg/kg
Isophorone	7	0.00%	387.14	670	140	-	29100000	-	ug/kg
Lead	6	66.67%	26.63	40.2	0.21	54.62	1000	25.6	mg/kg
Lithium	6	16.67%	10.22	11.6	0.25	11.55	20400	-	mg/kg
Manganese	6	0.00%	184.50	269	0.043	365.08	3480	-	mg/kg
Mercury	6	0.00%	0.02	0.036	0.0012	0.13	25200	-	mg/kg
Molybdenum	6	100.00%	1.63	2.4	0.13	-	5110	-	mg/kg
n-Nitrosodiphenylamine	7	0.00%	387.14	670	150	-	7810000	-	ug/kg
n-Nitrosodipropylamine	7	0.00%	387.14	670	180	-	5470	-	ug/kg
Naphthalene	7	0.00%	387.14	670	140	-	3090000	-	ug/kg
Nickel	6	100.00%	46.90	69.7	0.45	14.91	20400	-	mg/kg
Nitrate	6	100.00%	3.62	11.1	0.21	-	1000000	-	mg/kg
Nitrite	6	83.33%	2.00	5.1	0.25	-	102000	-	mg/kg
Nitrobenzene	7	0.00%	387.14	670	170	-	332000	-	ug/kg
Pentachlorophenol	7	0.00%	1871.43	3300	750	-	162000	-	ug/kg
Phenol	7	0.00%	387.14	670	140	-	613000000	-	ug/kg

Table 3
PAC 900-175 Summary of Analytical Results

Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	DL/RL	Backgound Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Plutonium-239/240	6	0.00%	11.81	13.1784	1.23	0.07	50	3800	pCi/g
Pyrene	7	100.00%	371.43	690	82	-	22100000	-	ug/kg
Selenium	6	0.00%	0.46	0.66	0.42	1.22	5110	-	mg/kg
Silver	6	0.00%	0.07	0.067	0.067	-	5110	-	mg/kg
Strontium	6	16.67%	30.12	51.4	0.016	48.94	613000	-	mg/kg
Tin	6	100.00%	1.70	2.3	0.29	-	613000	-	mg/kg
Uranium-235	6	0.00%	0.13	0.224	0.224	0.09	8	1900	pCi/g
Uranium-238	6	16.67%	1.53	2.9	1.64	2.00	351	1600	pCi/g
Vanadium	6	0.00%	27.03	30.4	0.31	45.59	7150	433	mg/kg
Zinc	6	83.33%	111.12	172	0.59	73.76	307000	-	mg/kg

DL/RL = Detection or Reporting Limit
- = Not Available
SD = Standard Deviation

3.0 DEVIATIONS FROM PLANNED SAMPLING SPECIFICATIONS

Deviations from the planned sampling specifications described in IASAP Addendum #IA-02-02 (DOE 2002a) are presented in the following table.

Table 4
PAC 900-175 - Deviations from Planned Sampling Specifications

Sampling Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Comments
CL43-0002	2084965.91	750060.59	2084985.46	750090.89	All sample location deviations resulted from utilities, structures, or auger refusal.
CK43-0002	2084929.95	750062.37	2084894.08	750064.21	
CL43-0001	2084985.43	750090.83	2084949.48	750092.62	
CL43-0000	2084949.48	750092.62	2084913.24	750078.42	
CK43-0000	2084913.52	750094.40	2084949.95	750075.39	

4.0 DATA QUALITY ASSESSMENT

The Data Quality Objectives (DQOs) for this project, as defined in the IASAP (DOE 2001), were achieved based on the Data Quality Assessment (DQA) provided in the following sections. The DQO/DQA process ensures that the type, quantity, and quality of environmental data used in decision making are defensible, with emphasis on attaining adequate (statistical) confidence in the decisions. The DQO/DQA process is based on the following guidance and requirements:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis; and
- DOE Order 414.1A, 1999, Quality Assurance.

4.1.1 Data Quality Assessment Process

The DQA process ensures the type, quantity, and quality of environmental data used in decision making are defensible. Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the result could impact project decisions. Particular attention is paid to those values near ALs when quality control (QC) results could indicate unacceptable levels of uncertainty for decision-making purposes. The DQA process is based on the following guidance and requirements:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis; and
- DOE Order 414.1A, 1999, Quality Assurance.

Verification and validation (V&V) of the data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review; and
- Kaiser-Hill Company, L.L.C.(K-H) V&V Guidelines:

12

  - General Guidelines for Data Verification and Validation, DA-GR01-v2, 2002a.
  - V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, 2002b.
  - V&V Guidelines for Volatile Organics, DA-SS01-v3, 2002c.
  - V&V Guidelines for Semivolatile Organics, DA-SS02-v3, 2002d.
  - V&V Guidelines for Metals, DA-SS05-v3, 2002e.

- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental, Response, Compensation and Liability Act (CERCLA) Administrative Record (AR) for permanent storage 30 days after being provided to the Colorado Department of Public Health and Environmental (CDPHE) and/or the U.S. Environmental Protection Agency (EPA).

4.1.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold-times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSD);
- Laboratory control samples (LCS);
- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (i.e., within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are

13

captured through application of validation "flags" or qualifiers to individual records. Validation results are summarized in the "Completeness" subsection.

Field sampling was conducted according to the approved IASAP, including related SOPs and addenda. Raw hardcopy data (e.g., individual analytical data packages) are currently filed by RIN and are maintained by Kaiser-Hill Analytical Services Division (K-H ASD); older hardcopies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil and Water Database (SWD).

Both real and QC data, as of June 11, 2003 are included on the enclosed compact disc (CD).

4.1.3 Accuracy

The following measures of accuracy were evaluated:

- Laboratory Control Sample Evaluation;
- Surrogate Evaluation;
- Field Blanks; and
- Sample Matrix Spike Evaluation.

Laboratory Control Sample Evaluation

The frequency of LCS measurements, relative to each laboratory batch, is given in Table 5. LCS frequency was adequate based on at least one LCS per batch. The minimum and maximum LCS results are also tabulated, by chemical, for the project. While not all LCS results are within tolerances, project decisions based on AL exceedances were not affected. Any qualifications of results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in the Completeness Section.

Table 5
Laboratory Control Sample Evaluation

CAS Number	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
120-82-1	1,2,4-TRICHLOROBENZENE	LC	68	76	2	2	%REC	SW-846 8270B
121-14-2	2,4-DINITROTOLUENE	LC	75	85	2	2	%REC	SW-846 8270B
95-57-8	2-CHLOROPHENOL	LC	70	73	2	2	%REC	SW-846 8270B
83-32-9	ACENAPHTHENE	LC	69	74	2	2	%REC	SW-846 8270B
7429-90-5	ALUMINUM	LC	92	94	2	2	%REC	SW-846 6010/6010B
7440-36-0	ANTIMONY	LC	88	90	2	2	%REC	SW-846 6010/6010B
7440-38-2	ARSENIC	LC	91	92	2	2	%REC	SW-846 6010/6010B
7440-39-3	BARIUM	LC	93	95	2	2	%REC	SW-846 6010/6010B
7440-41-7	BERYLLIUM	LC	90	90	2	2	%REC	SW-846 6010/6010B
7440-43-9	CADMIUM	LC	91	93	2	2	%REC	SW-846 6010/6010B
7440-48-4	COBALT	LC	88	90	2	2	%REC	SW-846 6010/6010B
7440-50-8	COPPER	LC	90	91	2	2	%REC	SW-846 6010/6010B
7439-89-6	IRON	LC	97	100	2	2	%REC	SW-846 6010/6010B
7439-92-1	LEAD	LC	90	93	2	2	%REC	SW-846 6010/6010B
7439-93-2	LITHIUM	LC	95	100	2	2	%REC	SW-846 6010/6010B
7439-96-5	MANGANESE	LC	91	93	2	2	%REC	SW-846 6010/6010B
7439-97-6	MERCURY	LC	93	93	1	1	%REC	SW-846 6010/6010B
7439-98-7	MOLYBDENUM	LC	87	90	2	2	%REC	SW-846 6010/6010B
7440-02-0	NICKEL	LC	91	93	2	2	%REC	SW-846 6010/6010B
14797-55-8	NITRATE AS N	LC	94	95	2	2	%REC	SW9056 OR E300.0 PREP E300.0
14797-65-0	NITRITE AS N	LC	96	96	2	2	%REC	SW9056 OR E300.0 PREP E300.0
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	LC	70	72	2	2	%REC	SW-846 8270B
106-46-7	P-DICHLOROBENZENE	LC	68	73	2	2	%REC	SW-846 8270B

Table 5
Laboratory Control Sample Evaluation

CAS Number	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
87-86-5	PENTACHLOROPHENOL	LC	66	70	2	2	%REC	SW-846 8270B
108-95-2	PHENOL	LC	70	75	2	2	%REC	SW-846 8270B
100-02-7	P-NITROPHENOL	LC	62	66	2	2	%REC	SW-846 8270B
129-00-0	PYRENE	LC	63	72	2	2	%REC	SW-846 8270B
7782-49-2	SELENIUM	LC	89	93	2	2	%REC	SW-846 6010/6010B
7440-22-4	SILVER	LC	92	93	2	2	%REC	SW-846 6010/6010B
7440-24-6	STRONTIUM	LC	92	94	2	2	%REC	SW-846 6010/6010B
7440-31-5	TIN	LC	88	89	2	2	%REC	SW-846 6010/6010B
7440-62-2	VANADIUM	LC	90	91	2	2	%REC	SW-846 6010/6010B
7440-66-6	ZINC	LC	90	95	2	2	%REC	SW-846 6010/6010B

Table 6
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
2	1,2-DICHLOROETHANE-D4	90	94	%REC
2	4-BROMOFLUOROBENZENE	94	95	%REC
2	TOLUENE-D8	95	95	%REC
SVOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
12	TERPHENYL-D14	69	88	%REC
12	2-FLUOROBIPHENYL	65	83	%REC
12	2-FLUOROPHENOL	60	79	%REC
12	NITROBENZENE-D5	59	79	%REC

Surrogate Evaluation

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 6. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are tabulated by chemical for the entire project. Any qualifications of results due to surrogate results are captured in the V&V flags, described in the Completeness Section.

Field Blank Evaluation

Results of the field blank analyses are listed in Table 7. Detectable amounts of contaminants within field or laboratory blanks could indicate cross-contamination of samples. However, none of the chemicals detected in laboratory blanks were detected in real samples with concentrations exceeding ALs; therefore, no significant laboratory blank contamination is indicated. Field blanks were not collected for this project. Consequently, all detectable concentrations of arsenic and lead are considered present at the sampling locations, and not due to cross-contamination.

Table 7
Field Blank Summary

Sample QC Code	Test Method Name	Analyte	Maximum Detected Value	Unit
RB	GAMMA	Uranium-235	0.2	pCi/g
RB	GAMMA	Uranium-238	4	pCi/g
FB	SW8260B	Toluene	2	ug/L
RB	SW8260B	Toluene	0.3	ug/L
FB	SW8260B	2-Butanone	4	ug/L
FB	SW8260B	Naphthalene	0.8	ug/L
Field Blanks (Trip, Rinse, Field) results greater than detection limits (not *U* Qualified)				

Sample Matrix Spike Evaluation

The frequency of MS measurements, relative to each laboratory batch, was adequate based on at least one MS per batch. The minimum and maximum of MS results are summarized by chemical, for the entire project in Table 8. Although low recovery values may indicate negative bias for some analytes, recovery values alone do not result in rejection of results. Qualification of results because of out of tolerance spike recoveries is noted by electronic flagging of the results.

Table 8
Sample Matrix Spike Evaluation

CAS Number	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
120-82-1	1,2,4-TRICHLOROBENZENE	MS	62	68	2	2	%REC	SW-846 8270B
121-14-2	2,4-DINITROTOLUENE	MS	70	85	2	2	%REC	SW-846 8270B
95-57-8	2-CHLOROPHENOL	MS	64	70	2	2	%REC	SW-846 8270B
83-32-9	ACENAPHTHENE	MS	64	75	2	2	%REC	SW-846 8270B
7429-90-5	ALUMINUM	MS	98	314	3	3	%REC	SW-846 6010/6010B
7440-36-0	ANTIMONY	MS	35	97	3	3	%REC	SW-846 6010/6010B
7440-38-2	ARSENIC	MS	91	97	3	3	%REC	SW-846 6010/6010B
7440-39-3	BARIUM	MS	102	103	3	3	%REC	SW-846 6010/6010B
7440-41-7	BERYLLIUM	MS	91	97	3	3	%REC	SW-846 6010/6010B
7440-43-9	CADMIUM	MS	90	100	3	3	%REC	SW-846 6010/6010B
7440-48-4	COBALT	MS	88	97	3	3	%REC	7440-48-4
7440-50-8	COPPER	MS	97	108	3	3	%REC	7440-50-8
7439-89-6	IRON	MS	102	672	3	3	%REC	7439-89-6
7439-92-1	LEAD	MS	94	99	3	3	%REC	7439-92-1
7439-93-2	LITHIUM	MS	100	105	3	3	%REC	7439-93-2
7439-96-5	MANGANESE	MS	98	100	3	3	%REC	7439-96-5
7439-97-6	MERCURY	MS	48	48	1	1	%REC	7439-97-6
7439-98-7	MOLYBDENUM	MS	83	98	3	3	%REC	7439-98-7
7440-02-0	NICKEL	MS	98	117	3	3	%REC	7440-02-0
14797-55-8	NITRATE AS N	MS	94	94	1	1	%REC	14797-55-8
14797-55-8	NITRATE AS N	MS	89	89	1	1	%REC	14797-55-8
14797-65-0	NITRITE AS N	MS	100	100	1	1	%REC	14797-65-0
14797-65-0	NITRITE AS N	MS	91	91	1	1	%REC	14797-65-0
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	MS	63	67	2	2	%REC	621-64-7
106-46-7	P-DICHLOROBENZENE	MS	60	65	2	2	%REC	106-46-7
87-86-5	PENTACHLOROPHENOL	MS	52	52	2	2	%REC	87-86-5
108-95-2	PHENOL	MS	64	71	2	2	%REC	108-95-2
100-02-7	P-NITROPHENOL	MS	60	61	2	2	%REC	100-02-7
129-00-0	PYRENE	MS	65	76	2	2	%REC	129-00-0
7782-49-2	SELENIUM	MS	90	96	3	3	%REC	7782-49-2
7440-22-4	SILVER	MS	90	102	3	3	%REC	7440-22-4
7440-24-6	STRONTIUM	MS	99	101	3	3	%REC	7440-24-6
7440-31-5	TIN	MS	85	97	3	3	%REC	7440-31-5
7440-62-2	VANADIUM	MS	100	121	3	3	%REC	7440-62-2
7440-66-6	ZINC	MS	78	98	3	3	%REC	7440-66-6

4.1.4 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSD. Adequate frequency of MSD measurements is indicated by at least one MSD in each laboratory batch. Although some RPD values, listed in Table 9, exceed the maximum target of 35 percent, all sample results were repeatable at concentrations well below their respective ALs.

Table 9
Sample Matrix Spike Duplicate Evaluation

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (percent)
1,2,4-TRICHLOROBENZENE	2	2	8
2,4-DINITROTOLUENE	2	2	8
2-CHLOROPHENOL	2	2	8
ACENAPHTHENE	2	2	5
ALUMINUM	3	3	3
ANTIMONY	3	3	1
ARSENIC	3	3	7
BARIUM	3	3	9
BERYLLIUM	3	3	6
CADMIUM	3	3	6
CADMIUM	3	3	6
COBALT	3	3	7
COPPER	3	3	25
IRON	3	3	98
LEAD	3	3	121
LITHIUM	3	3	7
MANGANESE	3	3	43
MERCURY	1	1	33
MOLYBDENUM	3	3	6
NICKEL	3	3	75
NITRATE AS N	1	1	1
NITRATE AS N	1	1	5
NITRITE AS N	1	1	1
NITRITE AS N	1	1	4
N-NITROSO-DI-N-PROPYLAMINE	2	2	9
P-DICHLOROBENZENE	2	2	7
PENTACHLOROPHENOL	2	2	7
PHENOL	2	2	11
P-NITROPHENOL	2	2	5
PYRENE	2	2	3
SELENIUM	3	3	5
SILVER	3	3	7
STRONTIUM	3	3	11
TIN	3	3	6
VANADIUM	3	3	10
ZINC	3	3	12

Field Duplicate Evaluation

Field duplicate results reflect sampling precision or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Data in Table 10 indicates that duplicate sampling frequencies were adequate for all suites except radionuclides.

A common metric for evaluating precision is the relative percent difference (RPD) value; RPD values are given in Table 11. Ideally, RPDs of less than 35 percent (in soil) indicate satisfactory precision. If contaminant concentrations exceeded ALs and the 35% RPD value, then associated results were reviewed to determine if the magnitude of imprecision could impact decisions (i.e., could sample concentrations measured below ALs exceed AL?).

Table 10
Field Duplicate Sample Frequency

Test Method Name	Sample Code	Number of Samples	Percent of Duplicate Samples
GAMMA SPECTROSCOPY	REAL	6	0
SW-846 6010/6010B	REAL	6	17
SW-846 6010/6010B	DUP	1	
SW-846 8270B	REAL	6	17
SW-846 8270B	DUP	1	
SW9056 OR E300.0 PREP E300.0	REAL	6	17
SW9056 OR E300.0 PREP E300.0	DUP	1	

Table 11
RPD Evaluation

Analyte	Max of RPD (percent)
1,2,4-TRICHLOROBENZENE	0
2,4,5-TRICHLOROPHENOL	0
2,4,6-TRICHLOROPHENOL	0
2,4-DICHLOROPHENOL	0
2,4-DIMETHYLPHENOL	0
2,4-DINITROPHENOL	0
2,4-DINITROTOLUENE	0
2,6-DINITROTOLUENE	0
2-CHLORONAPHTHALENE	0
2-CHLOROPHENOL	0
2-NITROANILINE	0
4-CHLOROANILINE	0
ACENAPHTHENE	0
ALUMINUM	2
ANTHRACENE	0
ANTIMONY	26
ARSENIC	8
BARIUM	5
BENZO(A)ANTHRACENE	37
BENZO(A)PYRENE	24
BENZO(B)FLUORANTHENE	19
BENZO(K)FLUORANTHENE	42

Table 11
RPD Evaluation

Analyte	Max of RPD (percent)
BENZOIC ACID	0
BERYLLIUM	29
BIS(2-ETHYLHEXYL)PHTHALATE	162
BUTYLBENZYLPHTHALATE	0
CHRYSENE	33
COBALT	2
COPPER	49
DIBENZ(A,H)ANTHRACENE	0
DIBENZOFURAN	0
FLUORANTHENE	29
FLUORENE	0
HEXACHLOROBENZENE	0
HEXACHLOROBUTADIENE	0
HEXACHLOROCYCLOPENTADIENE	1
HEXACHLOROETHANE	0
INDENO(1,2,3-CD)PYRENE	20
IRON	17
ISOPHORONE	0
LEAD	57
LITHIUM	6
MANGANESE	4
MERCURY	30
MOLYBDENUM	108
NAPHTHALENE	0
NICKEL	3
NITROBENZENE	0
N-NITROSODIPHENYLAMINE	0
PENTACHLOROPHENOL	0
PHENOL	0
PYRENE	37
SELENIUM	2
SILVER	0
STRONTIUM	21
TIN	34
VANADIUM	3
ZINC	2

4.1.5 Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 12 shows the number and percentage of validated records (codes without "1"), the number and percentage of verified records (codes with "1"), and the percentage of rejected records for each analyte group. The frequency of validation is within

21

project quality requirements for all suites except radionuclides. A check of hardcopy V&V records indicates that validation frequency is better than the minimum of 25 percent for both alpha and gamma spectroscopy, but the associated validation flags have not yet been uploaded to electronic records in the Soil Water Database (SWD). Following upload of the V&V flags to SWD, the validation frequency of electronic records will be acceptable.

The frequency of validation is in compliance with the RFETS validation goal of 25 percent of all analytical records indicating that these data are adequate.

Table 12
Validation and Verification Summary

Validation Code	Number of Records	Radionuclides	Metals	Inorganics
V&V	185	119	0	0
J	81	0	81	0
V	514	0	105	12
Total	780	119	186	12
Total Validated	595	0	186	12
Percent Validated	76%	0%	100%	100%
Total Verified	0%	0%	0%	0%
Percent Verified	0%	0%	0%	0%
Percent Rejected	0%	0%	0%	0%

KEY:
1, V1 - Verified
J, J1 - Estimated
UJ1 - Estimated detection limit
V - Validated

4.1.6 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with RFCA WRW and Ecological Receptor ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. "Adequate" sensitivity is defined as a reporting limit less than an analyte's associated AL, typically less than one-half the AL.

4.1.7 Summary of Data Quality

The RPDs greater than 35 percent indicate that the sampling precision limits of some analytes have been exceeded. However, the imprecision does not affect project decisions because with the exception of lead exceeding the Ecological Receptor AL but below background, there were no AL exceedances and no records were rejected. Compliance with the project quality requirements and RFETS validation goal of 25 percent of all analytical records indicates that these data are adequate. If additional V&V information is received, IHSS Group 900-4&5 records will be updated in SWD. Data qualified as a result of additional data will be assessed as part of the Comprehensive Risk Assessment process.

Data collected and used for IHSS Group 900-4&5 are adequate for decision-making.

22

5.0 REFERENCES

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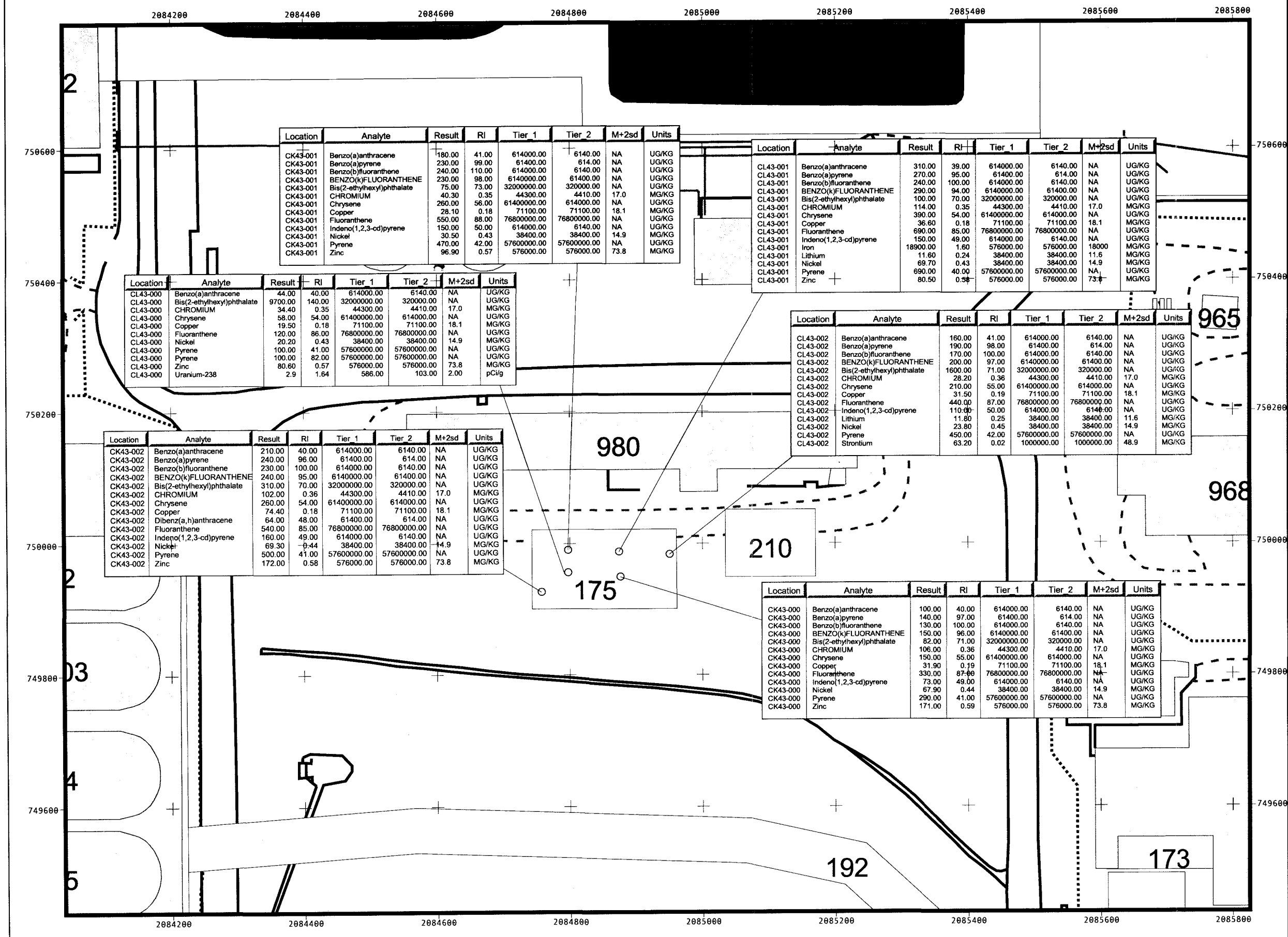
23/23

Figure 2
900-175 Surface Soil Results Greater than Background Mean Plus Two Standard Deviations or Reporting/Detection Limits



Location	Analyte	Result	RI	Tier_1	Tier_2	M+2sd	Units
CK43-001	Benzo(a)anthracene	180.00	41.00	614000.00	6140.00	NA	UG/KG
CK43-001	Benzo(a)pyrene	230.00	99.00	61400.00	614.00	NA	UG/KG
CK43-001	Benzo(b)fluoranthene	240.00	110.00	614000.00	6140.00	NA	UG/KG
CK43-001	BENZO(k)FLUORANTHENE	230.00	98.00	6140000.00	61400.00	NA	UG/KG
CK43-001	Bis(2-ethylhexyl)phthalate	75.00	73.00	32000000.00	320000.00	NA	UG/KG
CK43-001	CHROMIUM	40.30	0.35	44300.00	4410.00	17.0	MG/KG
CK43-001	Chrysene	260.00	56.00	61400000.00	614000.00	NA	UG/KG
CK43-001	Copper	28.10	0.18	71100.00	71100.00	18.1	MG/KG
CK43-001	Fluoranthene	550.00	88.00	76800000.00	76800000.00	NA	UG/KG
CK43-001	Indeno(1,2,3-cd)pyrene	150.00	50.00	614000.00	6140.00	NA	UG/KG
CK43-001	Nickel	30.50	0.43	38400.00	38400.00	14.9	MG/KG
CK43-001	Pyrene	470.00	42.00	57600000.00	57600000.00	NA	UG/KG
CK43-001	Zinc	96.90	0.57	576000.00	576000.00	73.8	MG/KG

Location	Analyte	Result	RI	Tier_1	Tier_2	M+2sd	Units
CL43-001	Benzo(a)anthracene	310.00	39.00	614000.00	6140.00	NA	UG/KG
CL43-001	Benzo(a)pyrene	270.00	95.00	61400.00	614.00	NA	UG/KG
CL43-001	Benzo(b)fluoranthene	240.00	100.00	614000.00	6140.00	NA	UG/KG
CL43-001	BENZO(k)FLUORANTHENE	290.00	94.00	6140000.00	61400.00	NA	UG/KG
CL43-001	Bis(2-ethylhexyl)phthalate	100.00	70.00	32000000.00	320000.00	NA	UG/KG
CL43-001	CHROMIUM	114.00	0.35	44300.00	4410.00	17.0	MG/KG
CL43-001	Chrysene	390.00	54.00	61400000.00	614000.00	NA	UG/KG
CL43-001	Copper	36.60	0.18	71100.00	71100.00	18.1	MG/KG
CL43-001	Fluoranthene	690.00	85.00	76800000.00	76800000.00	NA	UG/KG
CL43-001	Indeno(1,2,3-cd)pyrene	150.00	49.00	614000.00	6140.00	NA	UG/KG
CL43-001	Iron	18900.00	1.60	576000.00	576000.00	18000	MG/KG
CL43-001	Lithium	11.60	0.24	38400.00	38400.00	11.6	MG/KG
CL43-001	Nickel	69.70	0.43	38400.00	38400.00	14.9	MG/KG
CL43-001	Pyrene	690.00	40.00	57600000.00	57600000.00	NA	UG/KG
CL43-001	Zinc	80.50	0.58	576000.00	576000.00	73.8	MG/KG

Location	Analyte	Result	RI	Tier_1	Tier_2	M+2sd	Units
CL43-000	Benzo(a)anthracene	44.00	40.00	614000.00	6140.00	NA	UG/KG
CL43-000	Bis(2-ethylhexyl)phthalate	9700.00	140.00	32000000.00	320000.00	NA	UG/KG
CL43-000	CHROMIUM	34.40	0.35	44300.00	4410.00	17.0	MG/KG
CL43-000	Chrysene	58.00	54.00	61400000.00	614000.00	NA	UG/KG
CL43-000	Copper	19.50	0.18	71100.00	71100.00	18.1	MG/KG
CL43-000	Fluoranthene	120.00	86.00	76800000.00	76800000.00	NA	UG/KG
CL43-000	Nickel	20.20	0.43	38400.00	38400.00	14.9	MG/KG
CL43-000	Pyrene	100.00	41.00	57600000.00	57600000.00	NA	UG/KG
CL43-000	Pyrene	100.00	82.00	57600000.00	57600000.00	NA	UG/KG
CL43-000	Zinc	80.60	0.57	576000.00	576000.00	73.8	MG/KG
CL43-000	Uranium-238	2.9	1.64	586.00	103.00	2.00	pCi/g

Location	Analyte	Result	RI	Tier_1	Tier_2	M+2sd	Units
CL43-002	Benzo(a)anthracene	160.00	41.00	614000.00	6140.00	NA	UG/KG
CL43-002	Benzo(a)pyrene	190.00	98.00	61400.00	614.00	NA	UG/KG
CL43-002	Benzo(b)fluoranthene	170.00	100.00	614000.00	6140.00	NA	UG/KG
CL43-002	BENZO(k)FLUORANTHENE	200.00	97.00	6140000.00	61400.00	NA	UG/KG
CL43-002	Bis(2-ethylhexyl)phthalate	1600.00	71.00	32000000.00	320000.00	NA	UG/KG
CL43-002	CHROMIUM	28.20	0.36	44300.00	4410.00	17.0	MG/KG
CL43-002	Chrysene	210.00	55.00	61400000.00	614000.00	NA	UG/KG
CL43-002	Copper	31.50	0.19	71100.00	71100.00	18.1	MG/KG
CL43-002	Fluoranthene	440.00	87.00	76800000.00	76800000.00	NA	UG/KG
CL43-002	Indeno(1,2,3-cd)pyrene	110.00	50.00	614000.00	6140.00	NA	UG/KG
CL43-002	Lithium	11.80	0.25	38400.00	38400.00	11.6	MG/KG
CL43-002	Nickel	23.80	0.45	38400.00	38400.00	14.9	MG/KG
CL43-002	Pyrene	450.00	42.00	57600000.00	57600000.00	NA	UG/KG
CL43-002	Strontium	63.20	0.02	1000000.00	1000000.00	48.9	MG/KG

Location	Analyte	Result	RI	Tier_1	Tier_2	M+2sd	Units
CK43-002	Benzo(a)anthracene	210.00	40.00	614000.00	6140.00	NA	UG/KG
CK43-002	Benzo(a)pyrene	240.00	96.00	61400.00	614.00	NA	UG/KG
CK43-002	Benzo(b)fluoranthene	230.00	100.00	614000.00	6140.00	NA	UG/KG
CK43-002	BENZO(k)FLUORANTHENE	240.00	95.00	6140000.00	61400.00	NA	UG/KG
CK43-002	Bis(2-ethylhexyl)phthalate	310.00	70.00	32000000.00	320000.00	NA	UG/KG
CK43-002	CHROMIUM	102.00	0.36	44300.00	4410.00	17.0	MG/KG
CK43-002	Chrysene	260.00	54.00	61400000.00	614000.00	NA	UG/KG
CK43-002	Copper	74.40	0.18	71100.00	71100.00	18.1	MG/KG
CK43-002	Dibenz(a,h)anthracene	64.00	48.00	61400.00	614.00	NA	UG/KG
CK43-002	Fluoranthene	540.00	85.00	76800000.00	76800000.00	NA	UG/KG
CK43-002	Indeno(1,2,3-cd)pyrene	160.00	49.00	614000.00	6140.00	NA	UG/KG
CK43-002	Nickel	69.30	0.44	38400.00	38400.00	14.9	MG/KG
CK43-002	Pyrene	500.00	41.00	57600000.00	57600000.00	NA	UG/KG
CK43-002	Zinc	172.00	0.58	576000.00	576000.00	73.8	MG/KG

Location	Analyte	Result	RI	Tier_1	Tier_2	M+2sd	Units
CK43-000	Benzo(a)anthracene	100.00	40.00	614000.00	6140.00	NA	UG/KG
CK43-000	Benzo(a)pyrene	140.00	97.00	61400.00	614.00	NA	UG/KG
CK43-000	Benzo(b)fluoranthene	130.00	100.00	614000.00	6140.00	NA	UG/KG
CK43-000	BENZO(k)FLUORANTHENE	150.00	96.00	6140000.00	61400.00	NA	UG/KG
CK43-000	Bis(2-ethylhexyl)phthalate	82.00	71.00	32000000.00	320000.00	NA	UG/KG
CK43-000	CHROMIUM	106.00	0.36	44300.00	4410.00	17.0	MG/KG
CK43-000	Chrysene	150.00	55.00	61400000.00	614000.00	NA	UG/KG
CK43-000	Copper	31.90	0.19	71100.00	71100.00	18.1	MG/KG
CK43-000	Fluoranthene	330.00	87.00	76800000.00	76800000.00	NA	UG/KG
CK43-000	Indeno(1,2,3-cd)pyrene	73.00	49.00	614000.00	6140.00	NA	UG/KG
CK43-000	Nickel	67.90	0.44	38400.00	38400.00	14.9	MG/KG
CK43-000	Pyrene	290.00	41.00	57600000.00	57600000.00	NA	UG/KG
CK43-000	Zinc	171.00	0.59	576000.00	576000.00	73.8	MG/KG

KEY

- Surface Soil Location
- IHSS
- Solar Ponds
- Building
- Original Process Waste Line
- Paved Area
- Dirt Road
- Stream

Bdg_ft = Soil Begin Depth Feet
End_ft = Soil End Depth Feet
RI = Reporting/Detection Limit
M+2sd = Background Mean Plus Two Standard Deviations

N
W E
S

40 0 40 80 Feet

Scale = 1: 850

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS Date: 7.31.03

Prepared for: KAISER•HILL COMPANY

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